after obtaining no increase by the application of 1400 pounds of a fertilizer, over what had been obtained from a dressing of 400 pounds per acre, there might appear some cause for complaint. We cannot, however, indorse Dr. Sturtevant's opinions. Plot experiments may be made fairly representative of larger areas, and upon them various treatments of soil and crop may be compared. No doubt great care should be taken in carrying out such experiments; but surely a series of plots of $\frac{1}{4}$, $\frac{1}{10}$, or $\frac{1}{20}$ acre each might be and are made to teach most useful lessons. Dr. Sturtevant might well pause to consider that if such experiments are of no value the value of other experiments might be doubted, and the public, to whom he appeals, might think fit to rescind a grant amounting to £4000 a year for the purpose of carrying out his researches. The volume abounds in tables of analyses of fodder and grain crops. A large portion (200 pages) of the middle is occupied by a descriptive catalogue of varieties of beet, carrot, radish, turnip, onion, celery, spinach, squash, tomato, &c., mostly very wearisome, and savouring more of the catalogue of the seedsman than of the results of scientific work.

Downton. JOHN WRIGHTSON.

SCIENTIFIC SERIALS.

Bulletin de l'Académie Royale de Belgique, January.—Researches on the influence of magnetism and temperature on the electric resistance of bismuth and its alloys with lead and tin, by Ed. van Aubel. These protracted experiments have been undertaken in order to determine the variations of electric resistance due, not only to magnetism and heat, but also to molecular structure, with a view to discovering the causes of the disturbances and completing our knowledge of the phenomena first observed by Hall. In the present paper, a first contribution to the study of the subject, the author deals mainly with the diminution of the electric resistance of bismuth and its alloys under increased temperature. He shows that the anomaly cannot be due to the presence in the metal of foreign elements such as arsenic, tin, lead, or iron. The state of greater or less tension of the bismuth itself also seems to have no influence. But the study of some bismuth wire obtained by the soldering of the filings of this metal under a pressure of several thousand atmospheres constantly exhibits a considerable increase of resistance when the temperature is raised.—Experimental researches on the vision of the Arthropods, third part, by Felix Plateau. This part deals with the vision of caterpillars, and with the *rôle* of the frontal ocelli in the perfect insects. The very numerous experiments here described and carried out under the most varied conditions, tend to the general conclusion that in insects possessing both compound and simple eyes (ocelli), the former are of some service, while the latter are quite useless, and should consequently be grouped in the category of rudimentary or atrophied organs. In the case of caterpillars the vision is defective, not extending distinctly beyond one centimetre, and is supplemented by the antennæ and the fine hairs covering the body. Perfect insects when completely blinded almost invariably fly in a straight line vertically, which, against the opinion of Forel, is attributed to the more intense light of the higher regions, to which the whole surface of the body is susceptible. The primitive "dermatoptic sensation" is revived, and acts in a feeble way as a substitute for the later developed ocular vision of which the animal has been deprived.—On the molecular work of the organic liquids, by P. De Heen. It is shown that the author's formula of 1882, that for the organic fluids belonging to one and the same homologous series the molecular work is fairly constant, has been mainly confirmed by subsequent research.—This number of the *Bulletin* also contains a valuable paper by Louis Henry on the volatility of the carbon compounds, the result of several years' research.

Rivista Scientifico-Industriale, February 29.—On the peronospora of the grape-vine, by Prof. G. Cuboni. The two phases of this disease are fully described for the first time, and the disease itself is carefully distinguished from black-rot and other analogous forms of blight with which it is often confounded. A mixture of sulphur with 3 or 4 per cent. of the sulphate of copper is proposed as the best remedy if applied at an early stage.—Prof. E. Canestrini concludes his experiments on some effects produced by induction sparks. In one instance the leaves of some perennial plants were found to be covered with dark spots similar to those frequently observed on plants struck by lightning. But the results of these researches, like others of a similar kind, have obviously no more than a relative value, depending as they do on the intensity of the induced currents.

Journal of the Russian Chemical and Physical Society, vol. xix. No. 8.—Isomery in the series C_nH_{2n-2}, by A. Favorsky.—On the laws presiding at reactions of direct addition, by J. Kabloukoff.—Short notes by MM. E. Sokoloff, Joukovsky, and Gorboff.—Experimental researches into the oscillations of electrical force in electrolytes, by A. Sokoloff; it is the third of a series of elaborate papers on the subject, especially with regard to the capacities of voltameters.—On the measuring of specific heat by the method of mixtures at a constant temperature, by N. Hesehus.—End of a full bibliography of all books and articles printed in Russia on chemistry and chemical technology during the year 1886.

Journal of the Russian Chemical and Physical Society, vol. xix. No. 9.—On the speed of formation of acetic ethers of monatomic alcohols, by N. Menshutkin, being a first paper of a new series of researches where the compound influence of the surrounding medium in which the reaction is going on has to be studied.—Notes by MM. Matweieff and Spiridonoff.—On the empirical formula of cholic acid, by P. Latchinoff, being an answer to the criticisms against the new formula ($C_{25}H_{42}O_5$) proposed by the author.—On the gelatinous state of albuminoid bodies, by W. Mikhailoff, being the first of a series of papers intended to summarize elaborate researches on the subject, in accordance with the principles laid down by Lieberkühn and his followers.—On the number of parameters which determine the displacement of a kinematic chain, by P. Somoff. Taking up the view of Reuleaux, who recorded each mechanism as a kinematic chain, the author shows the necessity of considering the degree of freedom left to each part of the chain in its displacements in various mechanisms.—On the dependence of the colour of bodies on the angle of incidence of the rays of light, by W. Rosenberg.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 15.—"Report of the Observations of the Total Solar Eclipse of August 29, 1886, made at Grenville, in the Island of Grenada." By H. H. Turner, M.A., B.Sc., Fellow of Trinity College, Cambridge. Communicated by the Astronomer-Royal.

The first part of the paper gives details of the general arrangements made for observation—the selection of a site, the erection of the instruments, and a hut to cover them; and refers to the unfavourable conditions under which the observations were made. The second part gives the results of the observations. These were of two kinds.

(1) Before and after totality the order of appearance and disappearance of a number of bright lines in the spectrum of the chromosphere and inner corona was watched. The lines selected were those observed by Mr. Lockyer in the Egyptian eclipse of 1882, and the observations were undertaken with a view to the confirmation of his results.

The lines are denoted for convenience by small letters as follows:—

	λ.		λ.		λ.
a	4870·4	*e*	4917·9	*h*	4932·5
b	4871·2	*f*	4919·6	*i*	4933·4
c	4890·0	*g*	4923·1	*k*	4956·5
d	4890·4			*l*	4970·0

With this nomenclature, a table given by Mr. Lockyer in a short account of his results (Roy. Soc. Proc., vol. xxxiv., 1883, pp. 291, &c.) shows that lines *g* and *l* are seen by Tacchini in prominences, while *a*, *b*, *c*, *d*, *e*, *f*, and *k* are seen in spots.

Mr. Lockyer saw *g* and *i* 7 minutes before totality,
and in addition *k* and *l* 3 ,, ,,
and all the lines 2 ,, ,,

In my own observations I saw *g* 3 minutes before totality,
and in addition *i* 40 seconds ,,

while the moment of appearance of all the lines was indistinguishable from the commencement of totality.

After totality clouds obscured the sun for a short time; but on their clearing the visibility of *g* and *k* was noted; *i* could not be seen.

The three lines *g*, *i*, and *k* were extremely short, and did not appear to extend beyond the chromosphere before and after totality.

The unfavourable conditions under which the observations were made as compared with Mr. Lockyer's—with a low sun and through passing clouds, and an atmosphere charged with moisture which doubtless diminished the light in this region of the spectrum considerably—perhaps account in some measure for the striking difference in vividness of the phenomena. The solar activity was also much nearer minimum in 1886 than in 1882. As far as they go, however, the observations are confirmatory of Mr. Lockyer's, except in the visibility of the line *k* after totality. This line was not noted before totality, and it is possible that the observation may be spurious, although the evidence for it is as good as that for all the observations, which were found to be generally of a difficult character. The instrument used was a 6-inch refractor by Simms, with a grating spectroscope; the grating being 1½ inch square, ruled with 17,000 lines to the inch. The second order of spectrum was used.

(2) During totality I was directed to look for currents in the corona. I can only report a negative result. The structure of the corona appeared in a 4-inch refractor, with a power of 80, to be radial to the limb throughout, and no striking differences in special localities were noticed.

Appended to the paper are two drawings which do not attempt to give more than the distances to which the coronal rays extended in various directions. One was made by Mr. St. George with an opera-glass, and the other by Lieut. Smith with the naked eye; but in the latter case the observer's eyes had been specially covered fifteen minutes before totality, and the brighter portions of the corona were screened from him by a disk of angular diameter three times that of the moon. He consequently traced the rays much further than Mr. St. George, though, allowing for this difference in conditions, the drawings are fairly accordant.

"On the Ultra-Violet Spectra of the Elements. Part III. Cobalt and Nickel." By Profs. Liveing and Dewar.

The authors compare the results obtained by the Rutherfurd grating which they used in measuring the wave-lengths of the iron lines with those obtained with the larger Rowland's grating used for measuring the wave-lengths recorded in this paper, and find them closely concordant. They next compare the measures of wave-lengths of the cadmium lines obtained by them by means of a plane Rowland's grating and a goniometer with an 18-inch graduated circle with those obtained by Bell with a large concave grating of 20 feet focal length. The result of the comparison is that the plane grating gives measures which agree very closely with those given by the concave grating, while the former gives more light and is better for complicated spectra, such as those described in this paper, because the overlapping spectra of different orders are not all in focus together as they are when a concave grating is used.

The authors give a list of 580 ultra-violet lines of cobalt and 480 lines of nickel. They find a certain general resemblance of the two spectra, but no such exact correspondence as the close chemical relationship of the two metals would render probable. They point out that the coincidences of lines of the two metals are hardly, if at all, more in number than would have been the case if the distribution of the lines had been fortuitous. They give a map of each spectrum to the same scale as Ångström's normal solar spectrum.

Linnean Society, March 15.—W. Carruthers, F.R.S., President, in the chair.—On a ballot being taken, the following were elected Fellows of the Society: Messrs. J. W. Taylor, W. Gardiner, and David Sharp. The following were admitted Fellows of the Society: Messrs. A. G. Renshaw and A. E. Shipley.—Mr. J. Harting exhibited the frontal portion of the skull of a red-deer stag, which, although an adult animal, had never possessed horns, and made some remarks on the occasional occurrence of this abnormality. The stag in question was one which had been shot some years ago by the late Emperor of Germany in the Royal forest of Göhrde, in Hanover. A discussion followed in which the President, Mr. Seebohm, and Dr. Hamilton took part.—The first paper of the evening was then read by Mr. George Massee, entitled "A Monograph of the *Thelophoreæ*," and drawings of several of these Fungi were exhibited. The paper was criticized by Mr. A. W. Bennett and Prof. Marshall Ward.—In the absence of the author, a paper by Mr. E. A. Batters, describing three new marine Algæ, was then read by the Botanical Secretary, Mr. B. Daydon Jackson, who exhibited the drawings made to illustrate the paper. After some critical remarks from the President, Mr. Harting pointed out the indirect influence of the Gulf Stream in causing a deposition of northern sea-weeds upon the north-east portion of the English coast, where some of the species described had been found.

Zoological Society, March 20.—Mr. Henry Seebohm in the chair.—Mr. G. A. Boulenger read a note on the classification of the Ranidæ, in which, after speaking of the difficulty hitherto experienced in dividing this large group satisfactorily, he called attention to Peters's discovery that in certain forms a small additional phalanx is present between the ultimate and what is normally the penultimate phalanx. The author therefore proposed to separate the family Ranidæ into two groups, according to the presence or absence of this peculiar digital structure.—Mr. G. B. Sowerby gave the description of sixteen new species of shells, amongst which were two species of the genus *Lima* from Hong Kong and Japan; a remarkable species of the rare genus *Malletia* from the Bay of Bengal; a very distinct species of *Cypræa* from Japan; and one of the largest species yet known of the genus *Columbella*.—Mr. F. E. Beddard read some notes on a freshwater Annelid, of which he had obtained specimens from a tank in the Society's Gardens. Mr. Beddard referred these specimens to a new species of the genus *Æolosoma*, which he proposed to called *Æ. headleyi*.—Prof. Newton, F.R.S., communicated (on behalf of Mr. Scott Barchard Wilson) the description of *Chloridops*, a new generic form of Fringillidæ, based on a specimen obtained on the west coast of the Island of Hawaii, Sandwich Group, which he proposed to name *Chloridops koua*. Unfortunately the single example yet obtained was of the female sex.

Geological Society, March 14.—W. T. Blanford, F.R.S., President, in the chair.—The following communications were read:—On the gneissic rocks off the Lizard, by Howard Fox, with notes on specimens by J. J. H. Teall. The rocks may be classed under three heads: (1) the coarse gneisses or Mên Hyr type, (2) the light-banded granulitic gneisses or Wiltshire type, and (3) the transition micaceous rocks of "Labham Reefs," type intermediate between (2) and the mainland schists. The first are seen in Mulvin, Taylor's Rock, Man-of-war Rocks, the Stags, Mên Par, Clidgas, Mên Hyr, and Vasiler; the second in Sanspareil, the Quadrant and adjoining reefs, Labham Rocks, &c.; and the third in the Labham Reefs. The inclination of the divisional planes appeared conformable with that of the rocks of the mainland. The gneisses and granulites of several of the islands are traversed by numerous dykes of prophyritic basic rock, seen in Taylor's Rock, Man-of-war Rocks, Sanspareil, Quadrant Rock and Shoals, and Clidgas. These dykes have been disturbed by movements subsequent to their intrusion. They sometimes strike across the foliation-planes of the gneiss, and send veins into the latter rock; at other times the strike is parallel to that of the foliation-planes; the two modes of occurrence are occasionally observable in different portions of the course of the same dyke, *e.g.* in one traversing that part of the Man-of-war group known as the Spire. This dyke is also noticeable from the fact that it appears to be traversed by veins of gneiss. The dykes vary in width from 18 inches to several feet. In his notes on the specimens, Mr. Teall arranges the rocks in four groups. Prof. Bonney spoke in high terms of the value of the work done, as it was in a region accessible with difficulty, which time did not permit him to explore when working at the rocks of the mainland.—The Monian system, by the Rev. J. F. Blake. The reading of this paper was followed by a discussion in which the President, Dr. Hicks, Prof. Hull, and Prof. Bonney took part.

Royal Meteorological Society, March 21.—Dr. W. Marcet, F.R.S., President, in the chair.—The President delivered an address on atmospheric electricity. He first alluded to Franklin's experiments in America in 1752, who succeeded in obtaining the electricity of a storm-cloud by conducting it along the string of a kite sent into the cloud. De Romas, in Europe, repeated the experiment, and, having placed a wire within the twine his kite was attached to, obtained sparks of 9 or 10 feet in length. The characters of the two kinds of electricities were next described—the vitreous or positive, which was produced by rubbing glass, and the resinous or negative, obtained by rubbing sealing-wax or another resinous substance; and it was shown, by bringing suspended balls of pith within the influence of these electricities, that electricities of different kinds attract each other, and those of the same kind repel each other. De Saussure's and Volta's electroscopes were next described, pith-balls being used in the former and blades of straw in the latter for testing the pressure of electricity. With the object of measuring the force of electricity, Sir W. Thomson's electrometer was mentioned, in which the electricity is collected from the air by means of an insulated cistern letting out water drop by drop, each drop becoming covered with electricity from the atmosphere, which runs into the cistern where it is stored up, and made to act upon that portion of the instrument which records its degree or amount. The atmosphere is always more or less electrical, or, in other words, possessed of electrical tension, and this is nearly always positive; while the earth exhibits electrical characters of a negative kind. The effects of atmospheric electricity were classed by Dr. Marcet under three heads: (1) lightning in thunderstorms; (2) the formation of hail; (3) the formation of the aurora borealis and australis. He explained how clouds acquired their electrical activity by remarking that clouds forming in a blue sky, by a local condensation of moisture, became charged with positive electricity from the atmosphere; while heavy dark clouds rising from below nearer to the earth were filled with terrestrial negative electricity, and the two systems of clouds attracting each other would discharge their electricity, giving rise to flashes of lightning. In some cases a storm-cloud charged with positive electricity would approach the earth, attracting the terrestrial negative electricity, and when within a certain distance shoot out lightning which would apparently strike the earth; but it would just as well have struck the cloud, only there was nothing in the cloud to sustain any damage, while on the earth there were many objects lightning would destroy, to say nothing of its effects upon animal life. Thunder is the noise produced by the air rushing in to fill up the vacuum made by the heat of the lightning flash. There may be sheet lightning, zig-zag or forked lightning, or globular lightning. The latter is particularly interesting from its assuming a spherical form. Illustrations were given of objects struck by lightning, the most remarkable being, perhaps, the clothes of a working man which were torn into shreds, while the man himself was not seriously injured. Dr. Marcet next proceeded to show a flash of lightning, which he produced by throwing on a white screen the image of an electric spark 2 or 3 inches in length, enlarged by means of the lens of an optical lantern; forked lightning, 6 or 8 feet in length, with its irregular zig-zag course, was most clearly demonstrated. After alluding to the protecting power of lightning conductors and their construction, Dr. Marcet explained the formation of hail and waterspouts, and exhibited an instrument by Prof. Colladon, of Geneva, for showing the formation of waterspouts. He concluded his address with a few remarks on the aurora borealis and australis, the formation of which was illustrated by de la Rive's experiment, which consisted of successive discharges of electric sparks through a partial vacuum while under the influence of a powerful magnet; electric sheets of light were seen assuming the form of bands and possessed of a certain rotating motion.—Mr. G. J. Symons, F.R.S., read a short commuication on the non-existence of thunderbolts, and briefly described the history of several so-called thunderbolts, the specimens obtained being of an amusing character, thus clearly showing that they were of a terrestrial and not a celestial character.

EDINBURGH.

Royal Society, February 20.—Sir W. Thomson, President, in the chair.—A preliminary note on the duration of impact, by Prof. Tait, was communicated. The results already obtained were got by means of a roughly made apparatus designed for the purpose of testing the method used. When a wooden block of 10 lbs. mass fell through a height of 18¼ inches on a rounded lump of gutta-percha, the time of impact was found to be 0·001 sec., and the coefficient of restitution was 0·26.—A paper on a bathymetrical survey of the chief Perthshire lochs was read by Mr. J. S. Grant Wilson of H.M. Geological Survey. Lochs Rannoch, Tummel, Earn, and Tay, were specially dealt with. In the discussion which followed, Sir W. Thomson remarked that he did not consider that the ice had much to do with the formation of rock basins. Where it found a rock basin already in existence it might increase its dimensions.—Mr. H. M. Cadell, H.M. Geological Survey for Scotland, read a paper, of which an abstract appeared in our last issue (p. 488), on experimental researches in mountain building.—Mr. Peach communicated a paper by Dr. Ernst Stecher on contact phenomena of some Scottish olivine diabases.

March 5.—Mr. J. Murray, Vice-President, in the chair.—Mr. W. E. Hoyle communicated a paper by Mr. D. McAlpine on observations on the movements of the entire detached animal, and of detached ciliated parts of bivalve mollusks, viz. gills, mantle-lobes, labial palps, and foot.—The Chairman communicated a report on the fishes which he had obtained in deep water on the north-west coast of Scotland. The report was drawn up by Dr. A. Günther, F.R.S., Keeper of the Zoological Department, British Museum.—Prof. Haycraft read a paper by Dr. Carlier and himself on the morphological changes which take place in blood during coagulation.—A paper by Prof. Tait on the mean free path, and the number of collisions per particle per second in a group of equal spheres, was communicated. In this paper Prof. Tait cited De Morgan's definition of the term "mean," and pointed out the difference between the mean free path, properly so called, and the quantity to which that name is usually applied.—A preliminary note by the same author on the compressibility of glass at different temperatures was also read. The glass experimented upon was ordinary lead glass. At 8° C. the compressibility per atmosphere is 0·0000027, and increases by 0·00000002 per degree Centigrade of rise of temperature.

March 19.—Sir W. Thomson, President, in the chair.—Mr. George Seton read a paper on illegitimacy in the parish of Marnoch.—Dr. G. Sims Woodhead communicated some notes on the use of the mercuric salts as antiseptic surgical lotions.—In a paper on the effect of differential mass-motion on the permeability of gas, Prof. Tait gave the calculations which he promised in his reply to Prof. Boltzman published in the *Philosophical Magazine*.—The President read the second part of a paper by Mr. J. J. Coleman, on a new diffusimeter, and other apparatus for liquid diffusion, and discussed the determination of diffusivity in absolute measure from Mr. Coleman's experiments.—Sir W. Thomson also read an extract from a letter of the late William Froude to himself, dealing with the soaring of birds. Mr. Froude showed that in all cases soaring is dependent on the existence of upward air currents. In the case of a complete calm at sea, the upward current is produced by displacement as a wave passes underneath.—Mr. W. Peddie read a preliminary note on new determinations of the electric resistance of liquids by a method based upon Joule's law, and which therefore avoids any error which might be caused by transition-resistance or polarization.—Mr. C. A. Stevenson gave a notice of the recent earthquake in Scotland, with observations on those since 1882.

PARIS.

Academy of Sciences, March 19.—M. Janssen in the chair.—On certain points connected with the theory of accidental errors, by M. Faye. It is argued that the arithmetical mean does not necessarily and in all cases give the most probable result. The law of error can be regarded only as a simple approximation to the truth, although so far valuable that it may be freely applied to all sorts of observations and measurements, provided they be exempt from systematic error. The danger lies in excluding all extremes which might have the effect of enabling the observer to draw any conclusion he pleases, or which squares best with some preconceived view. The same subject is discussed in a paper by M. J. Bertrand on the probable value of the smallest errors in a series of observations.—On a point in the theory of the moon, by M. F. Tisserand. The object of these remarks is to determine in Delaunay's theory of the moon the full scope and application of the theorem of the invariability of the great axis of the lunar orbit. The demonstration here induced from Delaunay's method is extremely simple, and leads to some further interesting inductions.—New theory of the equatorial *coudé*, by MM. Lœwy and P. Puiseux. The paper deals with the corrective terms depending on the inner glass and the axis of declination. In a future paper will be given the terms depending on the outer glass, together with the complete formulas of reduction.—On the absorption of saline substances by plants, by MM. Berthelot and G. André. The experiments here described are mainly confined to the sulphate of potassa, and will in future be extended to other substances with a view to elucidate the obscure processes by which plants derive their mineral elements from the soil. The solution of the soil whence the roots derive the sulphate is shown to remain always richer than the solution penetrating into the vessels of the roots. Thus is confirmed the general law of this class of phenomena, and some important inductions are drawn from it in connection with the formation of the nitrates in certain plants.—On the relations of atmospheric nitrogen with vegetable humus, by M. Th. Schlœsing. Having previously studied the relations of vegetable earth with ammonia, carbonic acid, and oxygen, the author here extends his researches to its relations with atmospheric nitrogen.—On the actinometric observations made at Montpellier during the year 1887, by M. A. Crova. From these observations it appears that the calorific intensity, measured at noon, steadily increased from the beginning of winter nearly to the end of spring, attaining its monthly maximum (1·35 calorie) in May, and its absolute maximum (1·54 cal.) on the 24th of that month. Then it declined rapidly, its mean value during the summer being inferior to the means of other seasons. It rose, fell, and again rose in autumn, during which period it acquired a new maximum of 1·26. These observations confirm the general laws induced from the records of previous years, showing that, although the epochs of maxima and minima may often be exceptionally displaced, the maxima of radiation occur normally in spring, the minima in summer. Tables follow giving the mean annual intensities and other meteorological data for the five years 1883–87.—On the unification of the calendar, by M. Tondini. Reference is made to the recent steps taken by Italy for the purpose of promoting the universal adoption of the Gregorian calendar, which, thanks to the action of England, has already replaced the Chinese system in Japan under almost insurmountable difficulties.—Remarks accompanying the presentation of a model of the Fumat safety-lamp, adapted for use in mines subject to fire-damp, by M. Daubrée. This lamp, which has been for some time in use in the Grand Combe mines, has successfully withstood the severe tests to which it has been subjected by MM. Mallard and Le Châtelier, and seems to answer all the purposes of such an appliance quite as well as any other hitherto devised.—The meridian of Laghwat, by M. L. Bassot. The geodetic junction of Spain with Algeria, completed in 1879, has now been extended to Laghwat, 180 miles south of Algiers, and on the verge of the Sahara. This carries the great meridian for the west of Europe across 28° of latitude, from the northernmost point of Great Britain through France and Spain to about 33° N. latitude, on the confines of the desert. To the triangulation have been attached the astronomic stations Gelt-es-Stel and Laghwat itself, the latitude and longitude and an azimuth for each of these places having been accurately determined.—On the passage of the electric current through sulphur, by M. E. Duter. Sulphur, a very bad conductor at the normal temperature, is here shown to acquire a considerable degree of conductibility when raised to the boiling-point.—On the radiograph, by M. Louis Olivier. The instrument described under this name has been invented by the author as a self-acting recording photometer. At each revolution of the drum it closes an electric circuit, and thus automatically shuts off the luminous action at any desired moment. While serving in a general way as a registering apparatus for light, it is capable of venous applications in photography, meteorology, and physics.—On the hydrate of sulphurated hydrogen, by MM. de Forcrand and Villard. Having already made known the composition of this substance, $HS + 12HO$, and measured its tension of dissociation between $+0{\cdot}5$ and 29° C., the authors here resume its study for the purpose of more accurately determining this tension at or about the temperature of 0°. This is found to be about equal to atmospheric pressure.—Experimental researches on chronic intoxication by alcohol, by MM. A. Mairet and Combemale. Having previously described the influence of chronic alcoholic intoxication on the nervous and muscular systems, the authors here study its effects on the heart, the respiratory and digestive organs, and the bodily temperature.

BERLIN.

Physical Society, March 2.—Prof. du Bois Reymond, President, in the chair.—Dr. Gumlich spoke on Newton's rings as seen by transmitted light. The speaker had calculated and experimentally verified the formulæ for the rings as seen by transmitted light, in the same way as many years ago Prof. Wangerin had treated the rings when seen by reflected light, and subsequently verified the results of his calculations experimentally in conjunction with Prof. Sohncke. The outcome of Dr. Gumlich's calculation was the same as that of Prof. Wangerin for the rings seen by reflected light. When the light is incident at right angles, the rings are circles lying in one plane: when the angle of incidence is less than a right angle, the rings lie on a surface of extremely complicated shape, which is characterized by a primary ordinate, and an oblique ordinate at right angles to the former, which do not coincide at the point of intersection. By means of an apparatus which the speaker showed and carefully described, he had experimentally tested the accuracy of his calculations, and found them fully confirmed. When the light is incident obliquely, the rings are no longer circles as they are when it falls on to and passes through the medium at right angles, but are now ellipses whose axes bear a ratio to each other which is dependent on the angle of incidence of the light. It was not found possible to obtain any definite results as regards the width of the rings, since this is very largely affected by temperature.—Dr. Sprung reported on a work which had been sent in by Dr. Müller-Erzbach treating of the determination of mean temperature by means of the weight of water which is vaporized. A bulb blown on the end of a glass tube is half filled with water and introduced into a wide-necked flask whose bottom is covered with sulphuric acid. Assuming the truth of Dalton's law of tensions, Dr. Müller has arrived at a formula by means of which the mean temperature of a space can be determined from the mass of water which is vaporized in a given time.—At the end of the meeting Prof. Lampe discussed a reply which had been recently made to a criticism of his on a piece of work done last year by Dr. Häussler, and showed how devoid of foundation the reply was.

BOOKS, PAMPHLETS, and SERIALS RECEIVED

Geography of the British Isles: A. Geikie (Macmillan).—Pubblicazione del Real Osservatorio di Palermo, vol. iii. (Palermo).—Glen Desseray: Principal Shairp (Macmillan).—Die Wechselbeziehungen zwischen Pflanzen und Ameisen im Tropischen Amerika: A. F. W. Schimper (Fischer).—Encyclopædia Britannica, vol. xxiii. (Black).—Disease, its Prevention and Cure: C. G. Godfrey (Grevel).—Untersuchungen über Heterogenese, iii., Dr. A. P. Fokker (Groningen).—Journal of Morphology, vol. i. No. 2 (Ginn, Boston).

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